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1,000,000 YEARS OF CO-EXISTENCE: HOW THE MAMMALS TOOK OVER

SIX FRONTS IN ARCHAEOLOGY

THE RIGHT WORD IN TEXTILES

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PUSHING BACK THE DAWN

Recent discoveries in the fossil fields of western North America show that the emergence of modern mammalian groups began while the dinosaurs still flourished

LORIS S. RUSSELL, Chief Biologist

Palaeontologists, whose task it is to construct the history of life on the earth, have long been annoyed by the popular notion that dinosaurs and prehistoric men were contemporaries. From science fiction the myth has passed into the comic strip and the television cartoon, and seems to be unaffected by the blasts of the scholars. The evidence is clear to those who will read it: nearly 70 million years elapsed between the extinction of the dinosaurs and the appearance of a mammal that could be called human.

Recent discoveries, however, reveal a minute germ of truth in the idea of man and dinosaur, and have changed our thinking rather drastically about the beginnings of the modern groups of mammals. We now find that for a million years or more before the dinosaurs finally vanished, mammals were represented by a number of progressive groups, including possible ancestors of the primates, from which may have come the lemurs, monkeys, apes and humans. Also present were the earliest known representatives of the insectivores, the carnivores, and the ungulates. All of these mammals were small and inconspicuous among the contemporary dinosaurs, but they were there, unconsciously preparing for the greatest take-over in history.

To appreciate the significance of these new finds, we should consider

what was known previously on the origin and early history of the mammals. It has long been known that mammals originated in the latter part of the Triassic period, about 200 million years ago. The dinosaurs, curiously enough, made their appearance at about the same time, but from an entirely different group of reptilian ancestors. Dinosaurs came from the same stock that gave rise to the lizards, snakes, crocodiles, the extinct flying reptiles, and the birds. They quickly rose to a dominant position among land animals, and maintained this status for over 100 million years. Allusions to the dinosaurs as biological failures are most inappropriate. Not only were they the dominant group throughout that enormous interval, but they were highly diversified, including as they did the largest known land animals, the most powerful flesh eaters, the most efficient plant chewers, and one of the most extensively armoured vertebrates. Some of them superficially forecast the form of future mammals, such as the kangaroo, the rhinoceros, and the armadillo. Others produced bizarre structures like nothing that is known to have existed before or since. Dinosaurs ranged in size from the all-time giants to creatures no bigger than a domestic chicken. Some entered the water and became good, if not rapid, swimmers. Others, especially the small, light-limbed flesh-eaters, must have been swift and agile.

Such a record of diversity and adaption, unapproached by any other group of reptiles, suggests that the dinosaurs enjoyed some advantage over other members of that class. I have long held that this consisted of the ability to maintain a body temperature independent of the environment, the so-called warm-blooded condition. Unlike birds and mammals, which are also warm-blooded, dinosaurs had no insulating cover of feathers or fur, but for most of the Age of Reptiles (Mesozoic Era) the generally mild climatic conditions and absence of marked seasonal variations made this no disadvantage.

Mammals originated in the Triassic period from an entirely different branch of the reptilian class, the therapsids. These are best known from fossils found in South Africa, but examples have also been found in Europe, China, and the United States. The therapsids include some large reptiles, but those most directly ancestral to the mammals were rather small, ranging in size from that of a squirrel to that of a large dog. The earliest known true mammals were all very small.

What is a true mammal? Most of the distinctively mammalian features that can be preserved in fossils are present in the remains of the therapsid reptiles. These include the double condyle by which the skull is in contact with the first neck vertebra, also the tooth series differentiated into something resembling incisors, canines and molars, and the reduced number of joints in the toes. One feature that was long held to be distinctive is the manner in which the lower jaw hinged on the skull. In reptiles the joint is made up of a knob on the skull and a socket at the rear end of the lower

jaw. In mammals two entirely different bones are involved, and a rounded or cylindrical knob on the jaw fits into a correspondingly shaped socket on the skull. It was difficult to imagine a transition between two so very different hinge mechanisms, but recent discoveries of late Triassic mammals have shown that for a time the reptilian joint persisted after the mammalian joint had become functional. The arrangement was not a true double joint, but more like a pair of hinges, side by side, operating in the same axis.

Most of our knowledge of the mammals that lived during the Age of Reptiles is based on fossil jaws or isolated teeth. Fortunately, the mammalian dentition is a complex structure, capable of almost infinite variation, and each variation is characteristic of the particular group of mammals represented. In the Jurassic period which followed the Triassic, and during which the dinosaurs reached their maximum size and diversity, the mammals established themselves in two broad groupings of structure and habit, as indicated by the fossil teeth. One of these groups was herbivorous, feeding on soft vegetation. The front teeth of these mammals were enlarged like those of rodents, but probably more for nipping than for shearing. Behind these incisor teeth was a toothless gap, again like the condition in rodents, and then came a series of teeth, some for shearing, others for crushing, but all with a relatively large number of cusps or tubercles. For this reason these animals are known as multituberculates. Their way of life was successful for their time, and they persisted through the remainder of the Age of Reptiles and on into the beginning of the Age of Mammals, when they finally died out without leaving any descendants.

The other mammals of the Jurassic period, divisible into three or four sub-groups, had teeth with relatively few cusps, and obviously adapted to piercing and cutting. These were the flesh-eaters and insect-eaters of the time. Most of these sub-groups died out without leaving descendants, but those that we call pantotheres appear to have been the common stock from which all modern mammals were derived, with the possible exception of the strange egg-laying monotremes.

The Cretaceous period succeeded the Jurassic period, and was the last division of the Age of Reptiles. Cretaceous mammals at first were not much different from those of Jurassic time, judging by the few glimpses that we get in the fossil record. Later in the period, however, important changes took place, as we know from the rather numerous mammalian remains that have been found in rocks dating from late Cretaceous time. These specimens, mostly from the fossil fields of Wyoming, Montana, and Alberta, gave us what we thought was a representative picture of the mammalian life that was contemporary with the last dinosaurs. Multituberculates were still common, not much different from those of the Jurassic period, and almost all of the other mammals were marsupials, differing only in minor details from

the modern opossum. The so-called placental mammals, which make up the overwhelming part of the modern mammalian fauna, were apparently rare, being known only from a few isolated teeth from Wyoming, and two incomplete skulls of uncertain age from Mongolia.

That there was something wrong with this picture ought to have been suspected from what we knew of the beginning of the Age of Mammals. Fossil mammals have been found in rocks immediately above those containing the last dinosaurs, from New Mexico to Alberta. These date from the Paleocene epoch ("ancient dawn of the modern"), the earliest time division of the Age of Mammals. The fossil record indicates that by Paleocene time the marsupials had become relatively insignificant. Along with the still conspicuous multituberculates was a wealth of placental mammals, including primitive insectivores, primates, rodents, carnivores and ungulates. Could such a diversified assemblage have evolved from a few generalized ancestors in the relatively brief time between the last known Cretaceous mammals and the earliest of the Paleocene? Or was there an undiscovered fauna of Cretaceous mammals in which the direct ancestors of the modern groups were already present? For those of us who favoured the second hypothesis, it seemed as if we would have to look for these precocious mammals in the Cretaceous of the unexplored regions, such as the present Arctic, which had a temperate climate in those days.

The truth is that the missing ancestors were there all the time. It took a new technique to disclose them. The fossil hunter has traditionally relied on the natural processes of erosion to expose the treasures that he seeks. Sometimes the man-made erosion of quarrying and mining activities brings them to light. Many of the early finds of Cretaceous mammal teeth came from ant hills, where they had been concentrated along with tiny pebbles in the building of the mound. Some 30 years ago it occurred to palaeontologists to try speeding up the natural processes by soaking the fossil-bearing rock in water until it disintegrated into mud, and then screening the material through appropriate sieves to separate out the fossils. A sort of placer mining for bones and teeth, the technique was used with great success by Dr. Claude Hibbard of the University of Michigan to gather vast quantities of small mammal remains from the relatively soft sands and clays that date from the Ice Age.

Application of this technique to the older and harder rocks was the work of Dr. Malcolm McKenna of the American Museum of Natural History, formerly of the University of California. McKenna found that such material could also be distintegrated by prolonged or repeated soakings. By setting up a kind of production line, with adequate staff, he was able to obtain rich collections of small mammalian fossils at localities from which few such fossils had been known in the past.

Among the fossil deposits on which the technique was tried was that in eastern Wyoming where most of the known Cretaceous mammals had been collected by means of the old methods. The results were startling. Not only were well-preserved jaws of new placental mammals obtained, but the better material showed that some of the supposed marsupials previously known were actually placentals. The fauna is still being assembled and studied by Dr. William Clemens of the University of Kansas.

Even more spectacular finds of the same sort have been made in eastern Montana, in rocks of the same age as those of Wyoming. Back in 1930 some mammal teeth were found along Bug Creek, a tributary of the Missouri in McCone County. Subsequent efforts to relocate the fossil bed failed until two amateur collectors, Mr. Don Beckman and his daughter Donna, were successful in 1962. Subsequently collections were made here by Dr. Robert E. Sloan of the University of Minnesota and Dr. Leigh Van Valen of the American Museum of Natural History. These workers and others are currently studying the beautifully preserved material from this area.

Fossil mammals have been known for some years from the dinosaur-bearing Cretaceous rocks of Alberta. In 1963 Dr. Clemens, as a member of a field conference sponsored by the University of Alberta, discovered the jaw of a placental mammal in the upper part of the dinosaur-bearing beds on Red Deer River. Last summer Dr. Clemens returned as head of a joint Kansas-Alberta expedition and made important collections at this and nearby localities. The age of these fossil mammals is about the same as that of the material from Montana and Wyoming.

Interest is now turning to the occurrence of mammalian fossils in rocks older than those containing the last dinosaurs. During 1964 an expedition from the Royal Ontario Museum collected material from two older levels in the dinosaur fields of Alberta. In the United States, Dr. McKenna has made a start on assembling a mammalian fauna from rocks of similar age in Wyoming. There is a good chance that the "dawn" of the modern mammalian groups, now pushed back into the close of the Age of Reptiles, will be given an even earlier dating.

These new discoveries show that the differentiation of three or four major branches of the higher mammals began while the dinosaurs were still flourishing. Commonest are the so-called insectivores, distantly related to the modern hedgehogs, shrews and moles, but seemingly also trending towards the primates and the rodents. Other specimens represent small, dog-like carnivores and very generalized but characteristic ungulates. Here were the potential ancestors of most, if not all, of the mammalian orders that subsequently developed.

So we must discard the old idea that the mammals marked time for 100 million years, and began their amazing radiation only after the competition

from the dinosaurs had been removed by extinction. Mammals were evolving during the Age of Reptiles, and at least a million years before its close they began the differentiation of structure and mode of life that laid the foundations for their fantastically rapid and diverse development during the Age of Mammals. One might almost fancy that the Cretaceous mammals foresaw the coming extinction of the dinosaurs and were preparing in advance to take over. Actually the early mammals were creatures of low intelligence, as shown by the size and structure of the brain case in fossil skulls, so even the idea that they triumphed because of superior brain power is not supported by the record.

I think that the explanation of this precocious development of the higher mammals, which these recent discoveries has revealed, is related to the probable reason for the extinction of the dinosaurs, which I have discussed elsewhere. At about the middle of the Cretaceous period there was a great change in the plant life, involving the appearance and rise to dominance of the angiosperms, particularly the deciduous trees and shrubs. Such a development must have been a response to pronounced seasonal variations in climate, which seemingly were not present in the earlier part of the Age of Reptiles. If, as I have suggested, the dinosaurs were warm-blooded but uninsulated, they would be poorly fitted to cope with this new climatic factor. It is true that they survived for several million years after the trend began, but the effects of increasing accentuation of seasonal change finally caught up with them. The cold-blooded reptiles, such as turtles, lizards and crocodiles, withdrew into tropical regions or developed the habit of seasonal hibernation. But for the mammals the new conditions were ideal. Equipped with an independent body temperature and an external insulation, they could adapt themselves to varied and changing climatic conditions much better than any reptile, dinosaurian or otherwise. This was the luck of the mammals, to be potentially equipped for the climatic changes that began during the latter half of the Cretaceous period. They did not have to stand by and wait for a clear field; conditions were already swinging in their favour. Some may even have entered into direct competition with the smaller or younger dinosaurs for food supply or living space. If so, it was probably not a major factor in the extinction of the dinosaurs, which were doomed anyway, but even if those reptiles had withstood the physical adversity that seems to have been responsible for their destruction, they would eventually have been overwhelmed by the mammals, which were so much better qualified to meet the new conditions.

Thus these tiny jaws and teeth in the sieves of the modern fossil collector show us that the dawn of the Age of Mammals began while the sun was still setting on the Age of Reptiles.

NEW LIGHT ON MAN'S PAST

Extracts from the 1964 seasonal reports of ROM *archaeologists*

WALTER KENYON *reports on one of the projects in Ontario archaeology which carried him from the Bay of Quinte to Lake of the Woods, and from Toronto to James Bay:*

At the request of the Lennox and Addington Historical Society, a recently discovered burial ground on Palace Road, just east of Napanee, was investigated. It was probably the cemetery of the village of Clarksville, which developed into the present settlement of Napanee. This unmarked and forgotten burial place was probably used between the 1780s and the 1840s, after which date the Napanee cemeteries were established.

This presents an intriguing problem. How did the village manage to misplace its burial ground? Certainly, the pioneers were very busy with the arduous task of carving a settlement out of a rather remote wilderness, yet it seems somewhat similar to Toronto misplacing Union Station. Perhaps further work would shed some light on the problem, as well as furnishing scholars with some desperately needed data on the physical characteristics of a pioneer Canadian population.

SELWYN DEWDNEY *on recording pictographs:*

The systematic combing of the Canadian Shield region in Ontario for aboriginal rock art continued with the support of the Quetico Foundation, and the assistance in the field of the Department of Lands and Forests. Sixteen petrograph sites (paintings) and one petroglyph site (carvings) were recorded in northwestern Ontario. Of these nine were found to the west and north of Red Lake, three in Kenora District, two in the Rainy Lake area and two—including the glyphs—in the Thunder Bay area. A brief excursion into southeastern Ontario yielded two small sites on the upper St. Lawrence, opening up the possibility of further finds in the Thousand Islands where a tongue of the Canadian Shield crosses the international boundary.

Thanks to the *Fort William Times-Journal* and the Thunder Bay Historical Society it was possible to check rumours of rock paintings along a hundred mile stretch of the rugged northeast shore of Lake Superior. The trip established that these rumours were based on the former presence of pictographs scraped out of lichen by wind-bound *voyageurs.*

WALTER KENYON *in the British West Indies:*

Last March, the assistance of the Museum was requested in evaluating a recently discovered Indian village near the town of Plymouth, Montserrat, B.W.I. It proved to be a prehistoric Arawak village that was probably abandoned about A.D. 1200. Although only a few days were spent on the island, a fine sample of polychrome and incised pottery was collected, together with considerable data on the diet of the prehistoric natives. This was a simple reconnaissance but a fruitful one. The village is still there, largely undisturbed, and available for future research into the little known prehistory of the Leeward Islands.

DAVID PENDERGAST, *at Altun Ha, British Honduras:*

With support from the Harvie Foundation of Calgary and the Wenner-Gren Foundation, excavation began at the Maya site of Altun Ha (formerly called Rockstone Pond) on the northern coast of British Honduras. Little is known of cultural development in the British Honduras coastal strip, and tests indicate that this site may span the period from Pre-Classic to terminal Classic times. In addition, although Altun Ha is a ceremonial centre of only moderate size, surveys indicate extensive occupation remains surrounding the centre. They spread over perhaps as much as three square miles.

Work began with clearing of the central portion of the site, followed by excavation of portions of one of the six main pyramid-temple structures. At the same time two smaller structures were excavated, which with a third make up a range of "palace" structures forming the southern border of one of the two central plazas. The function of these structures is not clear, but it is assumed that they served as temples for minor gods in the Maya pantheon. The temple atop the pyramid was completely cleared, and was found to have several distinctive architectural features for which no parallels are known in neighbouring portions of the Maya area. The pyramid is of a stepped form, and is in far better condition than the temple, much of which has collapsed. Like the temple, the pyramid is unusual in form, particularly in the access stairways.

In an outlying area of the site, discovery of a large stone slab at ground surface led to the location of three tombs in a single mound. The tombs, which are of rather crude construction, contained significant collections of pottery, unusually large eccentric flints, jade and shell artifacts, pearls, and crystalline hematite objects, as well as a single stone human figurine which is very clearly within the range of the Olmec style.

A pattern of relationships is emerging . . . Coupled with the strong maritime emphasis reflected in the material culture of Altun Ha, there is some support to the possibility that Altun Ha may have been one of several links

in a chain of sites functioning as way-stations in a complex of Caribbean coastal trade.

DOUGLAS TUSHINGHAM *at Jerusalem. Here the* ROM *collaborated with the British School of Archaeology, with the support of the University of Toronto, Victoria University, the University of Trinity College, the University of St. Michael's College, McGill University and Knox College.*

The Armenian Garden, a large open space within the southwest angle of the city walls, has become *de facto* the prime Canadian responsibility. The British and Canadian parties were not segregated, however; members were assigned duties anywhere on the dig depending on individual interests and skills.

Literary records suggested that the Armenian Garden would produce evidence for the palace of Herod the Great and the camp of the Tenth Roman Legion, but the main reason for digging in this area was to discover whether there had been occupation on the western hill during the period of the Hebrew monarchy. On all scores the evidence is at present negative. The large Mameluke building discovered first in 1962 and excavated in 1963 and 1964 destroyed much of the earlier evidence, for in many places its foundations were carried down to rock. The area does not seem to have been occupied for some 700 years before the construction of this building and in the meantime erosion and the digging of enormous pits had almost completely destroyed the remains of the Byzantine period below. Evidence suggests that the main period of Byzantine occupation was in the 5th and 6th century but with the exception of some broken mosaic floors and a short stretch of an apse wall, Byzantine remains appear to be of unimportant private buildings and courtyards. Again, below the Byzantine levels, there were all the results of heavy erosion and pit-digging—a sure indication of break in occupation. The Roman levels below were very poorly preserved but suggest that the buildings were by no means important. Immediately above bed-rock—at about 30 feet below the surface—were strata containing pure 7th century B.C. pottery, i.e. the last century of the Hebrew monarchy. In spite of this there was no trace of a floor or housewall, and we can only assume that the pottery is from a midden dump. This reconstruction of the history of the area is in itself consistent enough, but excavations in other areas nearby pose several problems. . . .

Towards the end of this year's season, another puzzle was discovered—a system of underground galleries (some high enough to allow a person to walk upright) branching off in several directions and located under the extreme point of the southwestern hill. Evidence at present suggests that they go back to the time of the Hebrew monarchy but their purpose is still a mystery. It seems unlikely that they are drainage canals for such a com-

plicated system would not be required on the southwest hill which was not occupied until the 1st century B.C. at the earliest. Further they do not look like drains. Unfortunately the various galleries are blocked by fallen masonry and cannot be followed, at present, to their ends. And, to add to the difficulty, the municipality plans to build a road immediately above this complex before we resume excavation next year!

With the most generous support of the Jordan Government, the Municipality of Jerusalem, and the various owners of the property on which we are working, the problem remains. Jerusalem is a living and growing city and the problems for archaeologists in this fact cannot be completely circumvented.

CUYLER YOUNG *at Hasanlu, northwestern Iran: in this expedition the* ROM *joined the University Museum of Philadelphia, the Metropolitan Museum of Art in New York, and the Archaeological Service of Iran. Hasanlu, an Iron Age stronghold, was destroyed by invaders around 800 B.C.*

The attack—with the sacking and burning of the citadel which followed—has proven to be an archaeological blessing. Because the city was burned and destroyed in what would appear to be a matter of hours, ninth century B.C. Hasanlu has yielded a remarkable number of magnificently preserved antiquities in an architectural context no less remarkable for its state of preservation in detail. Excavations inside the citadel during the 1964 season saw the complete clearance of what has been provisionally called Burned Building II, a structure whose walls in some cases remain standing to a height of almost ten feet. The building is without question a religious structure of some kind.

Over forty human skeletons have been recovered from its great hall and several storage rooms: people who did not manage to escape before the roof and walls of the building, weakened by the raging fire, collapsed. Masses of objects of all types and description were also preserved in the collapse of this structure: bronze weapons, vessels and horse trappings; iron tools and weapons; wooden furniture, some of it most elaborately carved, and jewellery, made from a variety of materials and in quantities sufficient to bore workman and archaeologist alike.

The most important finds of the past season were, however, the ivories. Originally small decorative plaques fastened onto what were probably jewel boxes, and carved with elaborate scenes of war, the hunt and ceremonial life, these treasures of ancient art were recovered in a horribly smashed condition. Ivory is a very brittle substance under the best of conditions. When one adds the ravages of an intensely hot fire to the situation, chaos results. Almost all of the ivories had literally exploded at the time of the building's destruction, and excavation was a tedious job of shifting practically

every spoonful of earth from the two storerooms involved. Several years of conservation work lie ahead before the thousands of tiny fragments are all together. Enough, however, was recovered whole to indicate that the job is very much worth the effort.

TEXTILES, TERMS AND TEMPERS

Canada's role as mediator extends to a new area of international study—and dispute

HAROLD B. BURNHAM, Associate Curator of Textiles

In the autumn of 1954, a group of textile experts gathered in Lyon, France, to found a centre, international in scope, to further the study of ancient textiles. The choice of this city was a natural and appropriate one: for almost three centuries, silk and Lyon have been virtually synonymous, and the Musée Historique des Tissus where the meetings were held contains one of the world's outstanding textile collections. With the founding of the organization now known as Centre International d'Etude des Textiles Anciens (or CIETA in the alphabetical world of today), two major projects were adopted. One was a central reference file, to be established in Lyon, to hold a record of all important ancient textiles wherever they might be; the other, which had to take priority, was the preparation of a series of technical vocabularies in various languages defining exactly the terms to be used in completing the dossiers for the central file.

At the time, all this seemed fairly simple, but with more serious consideration, the latter project grew in importance. It was realized that it could serve far more than its initial purpose, and become a recognized working tool for scientific studies in the textile field. The standard approach to the dating and provenance of fabrics has long been on the basis of pattern and style. It would produce a much needed revolution if scholars were also to take into consideration the construction of the materials, and the capacity and type of equipment on which they were made. These points can all be of the greatest value in placing an object accurately in its proper context of time and place. Now that major steps have been taken towards the completion of CIETA's project, its great potential as a working tool for this fuller scholarly approach is being realized.

Work on the French, Italian and English versions of the Vocabulary was undertaken almost immediately. The French was completed first, and became

a standard for the others. It was the work of the late Félix Guicherd of Lyon who possessed an immense knowledge of silk weaving, a subject on which he had taught for over forty years as head of L'Ecole de Tissage in Lyon. Monsieur Guicherd's work was followed closely by the Italian version, the contribution of the late Prof. Tito Broggi who had published valuable researches on the early records of silk weaving in his native country, and had taught for many years as Professor of Textile Technology at Instituto de Setificio in Como.

The tasks encountered in the French and Italian versions were simple compared to that posed by the English one. Each of the former countries had a long tradition of silk weaving, and each had an established terminology connected with it. The English version had to be acceptable to scholars both in Great Britain and in the United States, and in neither country was there a terminology based primarily on silk, the material of which the greater part of extant ancient textiles was made. Each of these two countries had its own varied sets of terms, often regional, based on wool and cotton. Many English words were ambiguous or inexact, and there were multitudes of synonyms. At one time, both the noun and the verb "brocade" had exact technical meanings describing how the material was woven: with careless usage the noun has come to mean no more than a richly figured fabric. It has had to be discarded as a scientific term, having lost all value. The verb, on the other hand, remaining uncorrupted, has been retained in the vocabulary. Among synonyms, one simple example may suffice: the terms "shaft", "heddle", and "harness" for working parts of a loom, have long been used interchangeably despite the fact that the latter two have more important primary meanings. In working on the vocabulary, it was necessary to choose and make decisions, and the result has been that all three have been included, on the strength of their primary meanings. As defined, a heddle is now part of a shaft, and a shaft forms part of a harness.

In the first effort to solve some of these problems, Miss Dorothy G. Shepherd of the Cleveland Museum of Art, and Mr. John Beckwith of the Victoria and Albert Museum, prepared a preliminary draft based on the work of Monsieur Guicherd. This was presented to a special meeting at the Cooper Union Museum, New York, in 1956, and many helpful suggestions, criticisms, and amendments were proposed. One decision of the meeting was that the English version could not be a straight translation from the French: it had to be conceived and developed on a broader base. One other result was that the present writer became involved and, as time passed, more and more deeply entangled in the project.

Following this preliminary draft four separate versions of the English vocabulary have been prepared at biennial intervals. Each in its turn has produced its own crisis of one kind or another, even though each has been an

improvement on its predecessor. The first version was ready for the meetings held in 1957 when Miss Shepherd, Mr. Donald King of the Victoria and Albert Museum who had replaced Mr. Beckwith, and I sat down with the authors of the French and Italian versions checking through the three texts step by step, and correlating the technical terms in the three languages. Even granting that technical terms in various languages cannot always be synonymous, the differences were too great, and it was decided that a further effort was required to bring the English version more closely into line with the others. Despite some outcries from various quarters for the desperate and immediate need for an English version, it was agreed by all that an additional effort at conformity was required.

As a Canadian, I found myself in the middle writing simultaneously to London and to Cleveland, receiving answers, and then by persuasion, cajolery or other means trying to smooth out the differences between the English approach and the American. It was often far from easy. At times it was necessary, with supporting references, to be practically dictatorial, at others to refer the question to Monsieur Guicherd, and have his decision as final arbiter accepted. After this effort, a version which all three of us were sure was much better was distributed to the members of the organization. English-speaking scholars who had expressed interest in the project were asked for their comments.

The results discussed at Lyon in 1959 were most depressing. With the argument that they might have to expand, or perhaps alter, some of their historical thinking in the presence of a more technical approach, we were most sympathetic. This stricter discipline, after all, was one of the aims of the project; we, ourselves, had already been forced to accept it. Others, with whom we had less sympathy, felt that their own limited areas of intensive study had been slighted, or insufficiently explored. They had failed to grasp the purpose of the vocabulary in terms of the world-wide scope of textile research. We felt that still others were merely being petty, as if criticism and comment consisted solely in finding fault. Studying the comments, we realized that basically we were faced with differences in approach between English and American thought, and between French and American thought. Discouraging as our experience had been, all three of us felt that the project was of sufficient importance to justify further efforts towards agreement, and further efforts to bridge the gaps. As I felt particularly strongly, I volunteered to incorporate the valid criticisms that had been received, to review all the terms and definitions again, and to arrange for a special meeting where the project could be discussed.

This self-imposed task and the necessary correspondence with Lyon, London and Cleveland occupied much of 1960. When I was ready, Mr. Calvin Hathaway, of the Cooper Union Museum in New York, arranged

for meetings to be held there in the spring of 1961 to which all English-speaking members of CIETA were invited. About twenty attended, and Mr. Hathaway acted as chairman. I sat beside him, and for three days defended virtually every term and definition that had been established, explaining how decisions had been reached. It was necessary to re-write a few of the definitions that were not considered sufficiently clear, and to accept a few changes in terms to which I was sure my English colleagues would have no objection. After the results of these meetings had been incorporated in the text, I sent the new draft to Lyon, and to some of the European members of CIETA, in anticipation of the meetings planned for the autumn of 1961.

It was the hope of all concerned that this time the English-language share of the project had reached its final stage, but such was not to be. Ever since the foundation of the organization, there had been talk of a German version of the vocabulary, but up to this time no action had been taken. On receipt of my latest effort which now appeared to be final, the Gewebesammlung in Krefeld decided to use it in translation as the basis of a draft in German. This they completed promptly, and it was presented along with the English version to the meetings in October.

From the atmosphere in Lyon, it was soon obvious that a mistake had been made. The French felt keenly that their version was now the accepted cornerstone of the project; for the Germans to use the English, even though derived from the French, was a slight of international importance. A multilingual group gathered in the library of Musée Historique des Tissus to consider the problem, and it was soon obvious that the going would be hard. Definition after definition of the German text was subjected to detailed inspection, and a number of minor changes made.

At last we came to the term that from the beginning had been one of the major stumbling blocks in the English version. The word was "lampas", a French term for patterned silks of complex construction that had been incorporated in the English vocabulary as no other fully satisfactory term could be discovered. The English definition had been approved by Monsieur Guicherd in 1957. Close examination of the German text showed that it was somewhat broader in its application than the French were now prepared to allow. The French jumped at this opportunity, and threw out the German definition, but in doing so they failed to realize that the English one was automatically damned. The meeting broke up in utter chaos and a babel of tongues. After two days strenuous work, tempers were short; the Germans announced an end to any effort towards a vocabulary, and I announced that even after my years of work, I washed my hands of the whole project.

The gathering had been so tense that it took some time for tempers to settle down, but they finally did. About a month later in Scandinavia on a cool November day, I wrote to Lyon acknowledging that differences, usually

minor, were known to exist between the French and English versions. These had, in fact, been retained at popular request. With this admission, I undertook to make a complete and detailed comparison of the two versions drawing them together as closely as possible through changes in one or both, always working in the closest collaboration with Monsieur Guicherd. At the same time I laid down one condition: there was to be an understanding that when completed this final version of the English vocabulary might be used as the basis for versions in the North-European languages, while the French would naturally be the basis for the South-European languages. With this accepted, I took up the task again, comparing the French and English versions definition by definition and virtually word by word. It was also necessary to select and define English equivalents for the few French terms that were not covered by the earlier English drafts. With correspondence back and forth, this occupied my leisure time for yet another year. Finally, the effort was over, and the draft forwarded to Lyon in the spring of 1963.

At the meetings in Lyon in the autumn of that year, this last and final draft of the English vocabulary was unanimously adopted together with a Spanish version that had just been completed by Senor Torella Niubo of Museo Textil Biosca in Tarrasa. In 1964, the English version was published. We at the Royal Ontario Museum are happy to have been able to make a contribution to this important project, and with others who have worked on it over the years hope that it will form a firm basis for future textile research, and that it will be of help in writing and in understanding papers in this field. One result is that the Gewebesammlung in Krefeld is already at work on a new German version! It is also being used as a guide for the version in the Scandinavian languages on which much work has already been done. It is expected that both these will be ready for presentation at the next meetings of CIETA this coming autumn.

No mention of CIETA's vocabulary project is complete without a special tribute to the work of Monsieur Guicherd. The full weight of his knowledge was brought to bear on it. He was most generous and unstinting in his help, and it was his wide learning of the history and traditions of Lyonnaise silk weaving that solved many of the difficulties that arose. My own dealings with him have been of inestimable value: like others over the years of his long life, I have learned more about textiles from him than from anyone else. My first contact was a letter in 1956 which closed with the most formal of French salutations. As time passed, the tone of our correspondence grew warmer, and our relationship developed into a deep friendship. I received his last and final letter in the summer of 1963 which ended "Bon courage, mon cher".